

INFORMATION SYSTEMS STRATEGY: RECONCEPTUALIZATION, MEASUREMENT, AND IMPLICATIONS¹

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Abstract

*Information systems strategy is of central importance to IS practice and research. Our extensive review of the literature suggests that the concept of IS strategy is a term that is used readily; however, it is also a term that is not fully understood. In this study, we follow a perspective paradigm based on the strategic management literature to define IS strategy as an organizational perspective on the investment in, deployment, use, and management of IS. Through a systematic literature search, we identify the following three conceptions of IS strategy employed implicitly in 48 articles published in leading IS journals that focus on the construct of IS strategy: (1) IS strategy as **the use of IS to support business strategy**; (2) IS strategy as **the master plan of the IS function**; and (3) IS strategy as **the shared view of the IS role within the organization**. We find the third conception best fits our definition of IS strategy. As such, we consequently propose to operationalize IS strategy as the degree to which the organization has a shared perspective to seek innovation through IS. Specifically, our proposed IS strategic typology suggests an organization's IS strategy falls into one of the two defined categories (i.e., IS innovator or IS conservative) or is simply undefined. We also develop measures for this new typology. We argue that the proposed instrument, which was cross-validated across both chief information officers and senior business executives, has the potential to serve as a diagnostic*

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tool through which the organization can directly assess its IS strategy. We contend that our reconceptualization and operationalization of IS strategy provides theoretical and practical implications that advance the current level of understanding of IS strategy from extant studies within three predominant literature streams: strategic IS planning, IS/business strategic alignment, and competitive use of IS.

Keywords: IS strategy, IS strategic alignment, strategic IS planning, competitive advantage

Introduction

The information systems of an organization consist of the information technology infrastructure, data, application systems, and personnel that employ IT to deliver information and communications services in an organization (Davis 2000). Meanwhile, the term *information systems* also refers to the management of the organizational function in charge of planning, designing, developing, implementing, and operating the systems and providing services (Davis 2000). Thus, the concept of IS combines both the technical components and human activities within the organization as well as describes the process of managing the life cycle of organizational IS practices (Avgerou and McGrath 2007). Over the past two decades, IS has continued to grow in importance. A recent article in the *Wall Street Journal* (Worthen 2007) indicated that 87 percent of business leaders believe that IS is critical to their strategic success. Furthermore, IS spending still represents a major portion of organizational budgets, especially for organizations in IS intensive industries. For instance, a recent study conducted by the Tower Group (Cone 2005) predicted that firms in the IS intensive financial services sector are expected to collectively invest over \$450 billion in IS by 2010. Meanwhile, IS/business strategic alignment continues to be a major concern of CIOs and other organizational executives (Armstrong and Sambamurthy 1999; Brancheau et al. 1996; Chan et al. 1997; Earl 1993; Grover et al. 1993; Preston and Karahanna 2009a; Preston et al. 2008; Raghunathan and Raghunathan 1989; Smaltz et al. 2006; Stephens et al. 1992).

Due to the increasing importance of IS to the organization, understanding the strategic value of information systems has not only been the top goal of many IS practitioners (Galliers 1993; Luftman et al. 2006; McGee et al. 2005; Watson et al. 1997), but also has drawn the interest of IS scholars who have developed numerous investigations in this research domain over the past two decades. As a consequence, three closely related streams of literature have emerged, which include

strategic information systems planning (SISP) (Galliers 1991, 2004; Premkumar and King 1994; Ward and Peppard 2002), *alignment between IS strategy and business strategy* (Chan et al. 1997; Chan and Reich 2007; Henderson and Venkatraman 1999), and *competitive use of IS or using IS for competitive advantage* (Melville et al. 2004; Piccoli and Ives 2005; Wade and Hulland 2004). Each of these three streams continues to be a perennial area of importance among both practitioners and academics (Luftman and Kempaiah 2008). Aside from sharing longevity atypical of many IS issues, each of these three streams of academic research (SISP, IS alignment, and IS for competitive advantage) have been commonly centered on a key concept, *IS strategy*.

Despite the central importance of IS strategy in practice and across many well-developed lines of research, our extensive review of the literature suggests that the concept of IS strategy is a term that is readily used but not fully understood among the three aforementioned streams of literature. Specifically, the concept of IS strategy remains nebulous and is inconsistently defined and measured. For example, it is unclear whether IS strategy should be defined through its relation to business strategy (e.g., Chan et al. 1997) or as an independent strategy within the organization (e.g., Henderson and Venkatraman 1999). Further, while some researchers articulate that IS strategy is something that is planned in advance by management (e.g., Chan et al. 1997), others believe that IS strategy simply emerges as a pattern (e.g., Ciborra 1994, 2004). Meanwhile, there is the argument that IS strategy can be both planned in advance and can emerge without such planning (Benner and Tushman 2003; Galliers 2004). In addition, it remains ambiguous whether IS strategy should focus on the functional level (Adler et al. 1992; Ragu-Nathan et al. 2001), the strategic business unit level (Chan et al. 1997), the organizational level as a whole (Earl 1989), or across organizational boundaries (Finnegan et al. 1998).

Recognizing the need to better understand the concept of IS strategy (e.g., what an IS strategy is) as well as the content of IS strategy (e.g., which decisions comprise an IS strategy), the first goal of this study is to provide a definition of IS strategy designed to promote future research examining the organizational IS strategy development process.² While acknowledging the fact that in today's organization, business and IS often mutually drive one another (Earl 1989; Galliers 1993, 2004; Porter 2001), we suggest that, conceptually, IS strategy

²We acknowledge that both the concept of IS strategy and the process of IS strategic planning are important. In this study we focus on defining the IS strategy concept, and offer implications of our IS strategy definition to strategic planning.

needs to be examined independently of the examination of business strategy due to the argument that IS strategy can both support and lead business strategy (Agarwal and Sambamurthy 2002). Specifically, we draw on the findings in the strategic management literature to clarify the general definition of strategy as *an organizational perspective on setting and meeting organizational goals* (Mintzberg 1987), leading to our definition of IS strategy as *an organizational perspective on the investment in, deployment, use, and management of information systems*. Based on this definition, we set forth to review and examine the various ways in which IS strategy has been conceptualized in prior literature.

The second goal of this study is to deliver a new typology that operationalizes IS strategy in a way that can be applied in a holistic sense to the organization. Methodologically, the lack of valid measures for IS strategy within the extant literature has likely exacerbated the level to which this construct has been inconsistently applied. For example, somewhat incongruously, the SISP literature, which focuses on the development of an IS strategy (Galliers 1991), rarely discusses the IS strategy itself (Galliers 2004). The competitive use of IS literature treats IS strategy as a goal through which a firm seeks to obtain a competitive advantage. However, this stream of literature typically examines various organizational IS capabilities (Bharadwaj 2000; Mata et al. 1995; Ross et al. 1996), rather than a specific IS strategy. To date, the IS alignment literature (e.g., Chan et al. 1997; Sabherwal and Chan 2001) has gone the furthest in developing measures for IS strategy; however, the research in this stream of literature generally treats IS strategy as a realized (rather than intended) strategy³ that is designed to be dependent on and match with a certain business strategy. In addition, when measuring IS strategy, the alignment literature usually equates existing IS application portfolios with IS strategy (e.g., Chan et al. 1997; Oh and Pinsonneault 2007). As an attempt to resolve the current limitations within the extant literature, we developed a validated measure of IS strategy using survey data collected from 174 matched pairs of chief information officers (CIOs) and senior business executives. The findings of our empirical analysis suggest that an organization's IS strategy falls into one of two defined categories (i.e., IS innovator or IS conservative) or is simply undefined. By presenting a valid typology of IS strategy, we offer a diagnostic tool for both IS academics and practitioners to assess different organizational IS strategies.

The third goal of the study is to provide implications of our proposed IS strategy typology to the aforementioned three

closely related streams of literature around IS strategy (i.e., SISP, IS alignment, and IS for competitive advantage). In addition, we develop formal propositions that relate our conception of IS strategy to each stream of research. Specifically, we argue that organizations with different IS strategies will vary in their strategic IS planning practices. In addition, the nature of IS strategic alignment could differ across organizations that have different IS strategies. Finally, an organization's type of IS strategy, which is contingent upon the external environment, will have different levels of influence on organizational outcomes such as competitive advantage and firm performance. The propositions offered by the current study are intended to provide a theoretical basis for future empirical studies to develop testable hypotheses that could further advance the IS strategy research.

The remainder of the paper is organized as follows. The second section describes various definitions of strategy in the extant strategic management literature and justifies the definition of IS strategy employed by this study. The third section reviews and summarizes the three conceptions of IS strategy among 48 published articles about IS strategy from leading IS journals. Based upon this literature review, in the fourth section, we propose a new typology of IS strategy and associated measures that can effectively direct practitioners to a more applicable understanding of IS strategy. In the fifth section, we present three sets of propositions that describe the implications of the developed IS strategic typology in reference to the three outlined streams of IS strategy research. The limitations of the current study are provided in the sixth section. Section seven provides a conclusion for the paper.

Defining Information Systems Strategy

Prior research on IS strategy has been heavily influenced by the treatment of strategy in the field of strategic management (Chan and Huff 1992). In this section, we begin with an overview of strategy in the extant strategic management literature, and then discuss our definition of IS strategy.

Strategy in Management Studies

Strategy researchers have spent significant effort discussing the strategy construct from various angles (Cummings and Wilson 2003). Several streams of strategy research receive considerable attention, including research dedicated to defining strategy, distinguishing the characteristics of strategic decisions, and understanding the central issues of strategy at

³ An exception is the work of Henderson and Venkatraman.

different levels. We describe each of these research streams briefly here.

The first of these streams focuses on the central question of what is strategy (Andrews 1980; Mintzberg 1987; Porter 1996; Whittington 1993), or what constitutes a strategy (Fahey and Christensen 1986; Hambrick and Fredrickson 2001). Although, to date, there is no model that has received consensus (Markides 1999), there are several strategy models, including Porter's five-forces (Porter 1980) and the value chain model (Porter 1985), core competency theory (Prahalad and Hamel 1990), the resource based view of the firm (Barney 1991; Rivard et al. 2006), and other tools that aid in the analysis, development, and execution of strategy (Hambrick and Fredrickson 2001). While each of these tools reflects a useful perspective of strategy, they do not provide direct help in providing a clear definition of strategy.

The second major stream emphasizes characteristics for distinguishing strategic decisions from non-strategic decisions.⁴ Frequently cited characteristics of strategic decisions include their irreversible nature, the expected impact on long-term firm performance, and the directional nature, that give guidance to non-strategic decisions (Ackoff 1970; Ansoff 1965; Grant 2005; Hickson et al. 1990; Johnson et al. 2005; Wheelen and Hunger 2006). Similar to the first stream of research, this line of strategy research does not offer a tight definition of strategy per se.

The third stream has focused on the central questions that emerge from the existence of strategy at different organizational levels (Vancil and Lorange 1975; Varadarajan and Clark 1994). For example, at a corporate level, strategy that involves answering what businesses the corporation should be in (Porter 1987) is viewed as a major area of interest (Bowman and Helfat 2001; Collis and Montgomery 1998; Grant 2005; Hofer and Schendel 1978; Vancil and Lorange 1975). In contrast, business unit strategy deals primarily with addressing how to gain competitive advantage in a given business (Bowman and Helfat 2001; Grant 2005; Hofer and Schendel 1978) and hence is also referred to as *competitive strategy* (Porter 1987). Finally, functional strategy is primarily concerned with resource allocations to achieve the maximization of resource productivity (Hofer and Schendel 1978; Wheelen and Hunger 2006).

⁴Researchers have made the distinction between strategic and non-strategic decisions and have made this distinction through different categorizations of decisions. For example, prior research has distinguished between strategic and operational decisions (Johnson et al. 2005), strategic and tactical decisions (Ackoff 1970), and between strategic, administrative, and operational decisions (Ansoff 1965).

While strategy may include various decisions at different organizational levels, strategy is nevertheless recognized to be more than the sum of the strategic decisions it includes (Rumelt et al. 1994). In this sense, Lorange and Vancil (1977) consider strategy as a "conceptual glue" that ensures coherence between individual strategic decisions. However, whether this form of integration is achieved *ex ante* (i.e., through planning) or *ex post* (i.e., emergent) has remained a point of debate (Mintzberg 1990).

Strategy Defined as an Organizational Perspective

An attempt to bring structure and clarification to the discussion on the concept of strategy was brought forward by Mintzberg (1987), who identified five competing but inter-relating definitions of strategy that are the well-known *five Ps* for strategy. Specifically, strategy can be defined as (1) a plan (i.e., some sort of consciously intended course of action); (2) a ploy (which is a specific maneuver intended to outperform a competitor); (3) a pattern (i.e., a stream of realized actions); (4) a position (i.e., a means of matching between an organization and its external environment); and (5) a perspective (which is shared among organizational members, and the content of which consists of not just a position, but also an ingrained way of perceiving the world).

As Mintzberg (1987) has highlighted, each of the five Ps has its own legitimacy and therefore is complementary to the other definitions. For example, an intended plan (including ploy) reflects the means to achieve the strategy (Liddell Hart 1967; Steiner 1979), but does not provide the outcomes. Also, an examination of *ex post* patterns (e.g., the realized strategy) of various decisions (Andrews 1980) would not have much prescriptive value for strategy content nor provide guidance for future strategy content and therefore is not actually a strategy. Furthermore, the position (Porter 1996; Treacy and Wiersema 1994) allows an organization to understand where it currently is, but does not provide guidance regarding its future direction since this definition of a strategy is only a function of contingencies (i.e., focusing on how to manage environmental uncertainties).

For the purpose of the current study (i.e., to define a universal concept of IS strategy), we adopt the fifth definition, strategy as a shared organizational *perspective* on setting and meeting organizational goals. The main reason for this, suggested by Mintzberg, is that perspective might help provide a basis for overcoming the dilemmas that currently exist within the extant strategy research. Among these dilemmas is the clash between aforementioned intentional and emergent strategies

that both have relevance. The following quote from Mintzberg (1987, p. 16) summarizes the benefit of the perspective approach:

The fifth definition suggests above all that strategy is a concept. This has one important implication, namely, that all strategies are abstractions which exist only in the minds of interested parties—those who pursue them, are influenced by that pursuit, or care to observe others doing so. It is important to remember that no-one has ever seen a strategy or touched one; every strategy is an invention, a figment of someone's imagination, whether conceived of as intentions to regulate behavior before it takes place or inferred as patterns to describe behavior that has already occurred.

Therefore, viewing strategy as a perspective reconciles the two seemingly contradictory views (i.e., intentional versus emergent) on strategy, suggesting that strategy reflects the collective mind of all the organizational members through their intentions and/or by their actions. This definition indicates that a perspective is the most long-term view of strategy (Mintzberg 1987).

A Definition of Information Systems Strategy

Whereas strategy in management studies has drawn a long tradition of scholarly debate, IS strategy research, by way of comparison, has tended to eschew explicit discussion of what IS strategy is and, instead, has focused more on how to conduct strategic planning, how to align IS strategy with a given business strategy, or who should be involved in forming the strategy (Allen and Wilson 1996; Brown 2004; Codrington and Wilson 1994; Teo and Ang 2000; Wilson 1991, 1989). On one hand, it is quite clear that, applying Whittington's (1993) framework, most IS strategies described in the extant literature fall into the "classical" quadrant of strategy (i.e., IS strategic planning is a product of calculated deliberation with profit maximization as the goal). On the other hand, there remains a large degree of obscurity about IS strategy due to the absence of established typologies such as those found within business strategy literature. Moreover, a variety of terms have been employed to represent similar constructs such as IT strategy (Gottschalk 1999b), IS strategy (Galliers 1991), IS/IT strategy (Chan et al. 1997) or information strategy (Smits et al. 1997), among others (see Appendix A for a list of definitions found in IS and business literature). This plethora of terms creates confusion among researchers trying to interpret existing works (Allen and Wilson 1996).

As stated earlier, information systems is a broad concept (covering the technology components and human activities related to the management and employment process of technology within the organization); therefore, we find it most meaningful to use the term *IS strategy* throughout this paper. More specifically, following Mintzberg's (1987) fifth definition of strategy as a perspective, we define IS strategy as *the organizational perspective on the investment in, deployment, use, and management of information systems*. We note that the term of IS strategy is chosen to embrace rather than to exclude the meanings of the other terms. With this definition, we do not regard the notion of IS strategy as an *ex post* only or "realized IS strategy" as defined in the IS strategic alignment literature (e.g., Chan et al. 1997; Holland and Lockett 1992). Nor do we suggest that an IS strategy must be intentional as implied in the strategic information systems planning literature. This is because organizations, without an (formal or intentional) IS strategy, do use IS and hence make decisions regarding IS. For example, recent research (e.g., Oh and Pinsonneault 2007) has examined the pattern of IS deployment as an indication of IS strategy. However, we cannot infer an intentional IS strategy from the mere existence of IS within a company. Therefore, we contend that examining IS strategy as a perspective may resolve this dilemma.

Furthermore, our definition of IS strategy suggests that while IS strategy is part of a corporate strategy, conceptually it should not be examined as part of a business strategy. Rather, it is a separate perspective from the business strategy that addresses the scope of the entire organization (i.e., IS investment, deployment, and management) to improve firm performance. This view is consistent with Earl's (1989) work, which argues that IS strategy should both support and question business strategy. Therefore, this definition also implies that IS strategy should be examined at the organizational level, rather than at a functional level. Hence, while each individual business and IS executive can have his/her own view of IS, organizational IS strategy should reflect the collective view shared across the upper echelon of the organization (Mintzberg 1987). Meanwhile, this notion has implications for advancements in the stream of research that seeks to "align" the two separate strategies—business and IS. We will discuss these implications more explicitly in the concluding sections of the paper.

Three Conceptions of IS Strategy in the Literature

With the above definition of IS strategy in mind, we followed the literature review guidelines set by Webster and Watson

(2002) and conducted a comprehensive review and analysis of the prior IS strategy research (a detailed description of the approaches and processes that we employed to select and review the articles is provided in Appendix B). In particular, from the 1,600 plus articles published in the leading IS journals (through 2008) that used *IS strategy*, *IT strategy*, and *IS/IT strategy* as keywords, we identified 401 articles relevant to the broader field of IS strategy. From these 401 articles, we found 48 of them actually study the core construct of IS strategy, the remaining 353 articles discussed topics tangentially related to the central construct of IS strategy such as the process for developing such a strategy, the strategic impacts of IS, or the alignment of IS with the business strategy, all of which we label as contextual elements of the IS strategy.

The conceptual framework shown in Figure 1 depicts the relationships between the IS strategy and its contextual elements.⁵ Specifically, IS strategy is an output of the strategic development process and can hence be distinguished from the latter. Furthermore, IS strategy is also different from the (desired) impact of these decisions such as competitive advantage, which may only be achieved through the implementation of an appropriate IS strategy. Finally, as we described in the previous section, IS strategy can be distinguished from its counterpart on the business side (i.e., the business strategy). The reconciliation of the IS strategy with the business strategy has spawned the topic of strategic IS/business alignment (Henderson and Venkatraman 1999). We note that business strategy has implications for the IS strategy development process, IS strategy itself, and the impact of IS strategy, and thus include it in the framework.

Since IS strategy is the focus of the current study, in our literature review below, our analysis summarizes the 48 articles that study IS strategy *per se*. We also discuss the implications for the contextual elements (i.e., process, impact, and business/IS strategic alignment) of the IS strategy construct displayed in Figure 1. In particular, we analyzed these 48 articles along the three contextual elements and identified three different conceptions of IS strategy employed implicitly in these articles: (1) IS strategy as *the use of IS to support business strategy*; (2) IS strategy as *the master plan of the IS function*; and (3) IS strategy as *the shared view of the IS role within the organization*. In fact, deriving the conceptions of IS strategy from these articles was challenging, because many authors used the term (e.g., IS or IT strategy)

without defining it. We therefore developed these conceptions inductively by examining the theoretical basis, research questions, and content of these articles.

It is important to note that a conception of IS strategy is not necessarily synonymous to a definition. While a definition specifies the content and scope of the construct, a conception reflects the set of underlying assumptions that an author has inherited (mostly implicitly) about a construct (Fauconnier and Turner 1998; Laurence and Margolis 1999). The three conceptions of IS strategy (see Table 1) that we identified from the 48 studies reflect the three general assumptions of the authors related to the contextual elements of IS strategy outlined above (i.e., process, impact and alignment). The details of the 48 articles and the dominant conception of each article⁶ are provided in Appendix C.

Conception I: IS Strategy as the Use of IS to Support Business Strategy

Twenty articles were categorized within the first conception that describes IS strategy as the use of IS to support business strategy. In particular, conception I answers the question of the way in which IS can help the business gain and sustain competitive advantage (Brady and Targett 1995; Duhan et al. 2001; Hidding 2001). Earl (1989) proposes that the management strategy for IS organizations consists of three sub-domains (the *triangle model*): (1) *what* has to be done; (2) *how* does it have to be done; and (3) *who* should do it. Earl labels these three sub-domains as IS, IT, and IM (information management) strategy, respectively. Applying Earl's model, conception I is similar (but not identical) to the *what* sub-domain. For example, Earl (1989) indicates that the *what* sub-domain (or IS strategy) is about aligning IS development with business needs.

Conception I suggests that the initiation of an IS strategy must be linked with an established business strategy (Atkins 1994; Hatten and Hatten 1997), or what Mintzberg (1987) labeled as a *position*. For example, if a company has chosen a market development strategy following Ansoff's (1965) strategic framework (i.e., growth vector), the IS strategy would entail those strategic IS resources that are deemed to support market development (Atkins 1994). Or, if a company has chosen a cost leadership business strategy following Porter's (1980) generic strategy framework, the IS strategy would need to

⁵We acknowledge that, using a *perspective* lens to define IS strategy, organizational IS strategy should also reflect external influences such as bias and philosophical beliefs of decision makers. However, we take a narrower scope in selecting the contextual elements and did not include these influences in Figure 1.

⁶Eight of the 48 articles exhibited characteristics of two dominant conceptions in different sections of the article, in these cases, we count and categorize them into both conceptions.

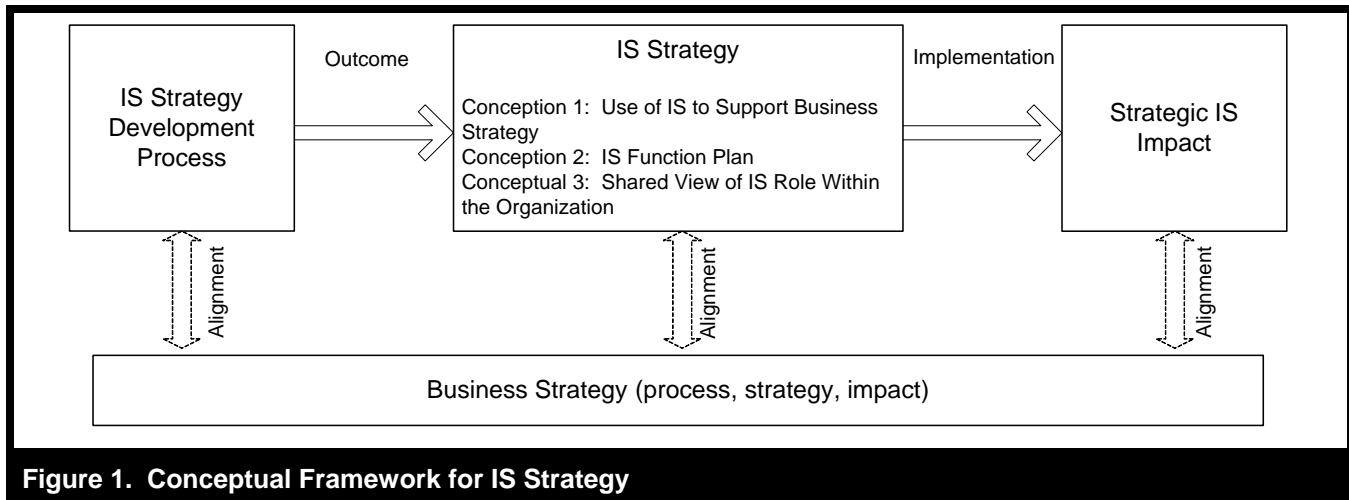


Figure 1. Conceptual Framework for IS Strategy

Table 1. Three Conceptions of IS Strategy Identified from IS Literature

Conception: IS strategy as...		the use of IS to support business strategy	the master plan of the IS function	the shared view of IS role within the organization
Differences in the definition of IS strategy (or the questions answered by the IS strategy) applying Mintzberg (1987)'s Ps.		Position: For a chosen business strategy, how can IS be used to support business strategy/gain and sustain the targeted competitive advantage?	Plan: What IS assets (IS staff, IS process, infrastructure, applications, IS budget) are required and how to allocate the existing ones efficiently?	Perspective: What is our view towards IS within the organization?
Assumptions related to the IS strategy development process	Starting point when developing IS strategy	A chosen business strategy	The IS function	The managerial attitude toward IS
	Standpoint taken when developing IS strategy	Business-centric	IS-centric	Organization-centric
	Relationship between IS and business strategy	IS strategy is developed as an inherent part of the business strategy. IS strategy is not a strategy in its own.	IS strategy is developed in isolation from business strategy. IS strategy is viewed as functional level strategy.	IS strategy can be developed separately from the business strategy. IS strategy is an organizational level strategy.
Assumptions related to the IS strategic impact	Desired impact of IS strategy	Ensure business strategy is implemented and the desired strategic position of a business is achieved.	Identify IS assets requirements; ensure required assets are retrieved and effectively allocated.	Provide a shared understanding across the organization to guide subsequent IT investment and deployment decisions.
Assumptions related to IS/business strategic alignment		Intrinsic <i>a priori</i> alignment	<i>Ex post</i> alignment	Dynamic alignment
Number of articles identified [†]		20	27	9

[†]Since no article explicitly mentioned its conception, we tried to categorize each article based on the conception that was most dominant throughout the article. Eight of the 48 articles exhibited characteristics of two conceptions in different sections of the article; in these cases, we count and categorize them into both conceptions.

include IS initiatives that help this organization enhance its cost position (Brady and Targett 1995).⁷

Because IS strategy is a derivation of the business strategy in this case, we argue conception I is *business-centric*. By definition, IS and business strategy are intrinsically linked and alignment is achieved already when developing the IS strategy (i.e., *a priori*). A contribution of this conception is that, since the strategic management research has established a number of useful theoretical bases (e.g., the resource-based view, the market-based view, dynamic capabilities, or game theory), IS researchers can readily leverage these theoretical bases to advance IS strategy research (Chan and Huff 1992).

However, conception I is limited in that it implies that IS strategy is not a strategy on its own. The literature within this research stream tends to imply that an IS strategy would not even exist unless an organization has a clearly defined business strategy to support, or would not exist if the organization does not seek to obtain a competitive advantage through IS. While one can argue that an organization needs to articulate a business strategy, the reality is that many companies do not have an explicit business strategy (Mintzberg and Waters 1985). For these organizations with merely an implicit business strategy, conception I may not apply because the basis for IS strategy becomes less clear. However, although it might be difficult to interpret the business strategy, IS strategy could still exist among these organizations. For these organizations, it is more likely that the IS strategic development process would become more informal.

Furthermore, as we described earlier, some researchers (e.g., Agarwal and Sambamurthy 2002; Earl 1989; Galliers 2004; Preston and Karahanna 2009b) have articulated that IS strategy should not only support but also potentially push the business strategy. For example, Earl (1989) proposes that IS strategy can be led by the business side; however, alternatively the purpose of the IS strategy can also be to question the business strategy. Furthermore, Galliers (1991, 1993, 2004) argues that IS strategy should be considered as an integral strategy that implies the potential impact of IS on organizational performance as well as the attendant change management issues resulting from IS driven business initiatives. Therefore, viewing IS strategy as a dependent subset of business strategy could be regarded as a circumscribed view. We argue that whether or not an explicit business strategy exists, organizations need guidance for IS-related decisions that are not necessarily directly accounted for by the business strategy.

⁷See the appendix in Chan and Huff (1992) for a list of other business strategy frameworks.

Conception II: IS Strategy as the Master Plan of the IS Function

Conception II, which is highly prevalent in the existing literature (e.g., we observed 27 articles in this category), provides a broader view of IS strategy than conception I. Although the IS function is an essential part of the organization and the ultimate goal of the IS function is to support and enable business performance, the second conception focuses on the strategy to run the IS function effectively and efficiently. In this conception, IS strategy is a *plan* (Mintzberg 1987) that aims to (1) identify the required IS assets, including personnel (e.g., IS staff and its capabilities), structure (e.g., IS processes), monetary resources (e.g. IS budget), and technologies (IS applications and infrastructure); and (2) allocate the existing IS assets in the most efficient way. This conception covers the second (IT strategy) and third (IM strategy) sub-domains of Earl's (1989) triangle model. For example, Earl (1993) articulates that the purpose of IT strategy is to direct the efficient and effective management of IS resources and that of IM strategy is to develop technology policies and architecture. In this sense, this second conception is *IS-centric* since IS strategy is a long-term plan for an array of the IS related artifacts (Orlikowski and Iacono 2001) within the organization.

Stated differently, the assumptions underlying this second conception suggest that IS strategy is ascribed as a functional strategy,⁸ rather than an organizational strategy. Therefore, it becomes clear that, although many of the IS resources are core to the business or complementary to business resources, this conception of IS strategy (in contrast to conception I) can be examined as independent of the organization's business strategy as it focuses on the effective management of the IS function to best allocate and utilize IS resources (Earl 1989, 1993). Within the articles that apply this conception, IS strategy is sometimes regarded as the business strategy of the IS function, which has been labeled as a "business within a business" (Adler et al. 1992; Ragu-Nathan et al. 2001) or an "organization within an organization" (Ragu-Nathan et al. 2001, p. 277) that requires "due attention to its key processes, resources, and internal and external linkages" (Adler et al. 1992, p. 20). As stated by Ragu-Nathan et al. (2001), the IS function "is in the business of providing services to users within the organization who, therefore, may be regarded as customers" (p. 277). In addition, it also requires its own (functional) "strategy directed toward developing an end

⁸Functional strategy is primarily concerned with the allocation of resources in order to achieve the maximization of resource productivity (Hofer and Schendel 1978; Wheelen and Hunger 1986).

product (i.e., information systems) which is sought by users” (p. 278). These statements suggest that the IS functional unit may have a strategy that is separate from the strategies of the other functional business units. Thus, IS strategy and business strategy alignment requires an *ex post* approach as both strategies need to be developed concurrently.

A benefit of conception II is that it provides a more comprehensive picture of IS function planning than conception I. Furthermore, this conception can also be applied as a guideline for IS decisions in organizations that do not have a clearly defined business strategy or in organizations that do not necessarily regard IS as a source of competitive advantage (Duncan 1995; Hagel and Brown 2001; Oosterhout et al. 2006; Ross et al. 2006). However, the limitations of this conception are salient. First, an emphasis on the IS function might create difficulty for business functions to understand IS strategy and thereby build possible barriers to aligning IS strategy with business strategy (Agarwal and Sambamurthy 2002; Chan 2002). Second, viewing IS as a business within a business might lead to functional decisions that are made in isolation and may therefore be suboptimal to current or future business strategies and not in line with organizational objectives designed to improve firm performance (Baldwin and Curley 2007). Hence, the theoretical bases of this conception of IS strategy are not as clear as in the first conception.

Conception III: IS Strategy as the Shared View of the IS Role Within the Organization

A third conception implicitly revealed from the extant literature describes IS strategy as a shared view regarding the role that IS plays within the organization. In this sense, IS strategy is viewed as an organizational *perspective* (Mintzberg 1987) that guides future IS-related business decisions and activities rather than of a concrete plan or a position as in the previous two conceptions. Such a perspective reflects the top management team’s (TMT) (including IS executives’) attitude toward IS that might be based on prior experience, personal preference, or industry requirements (Nolan and McFarlan 2005). We found several different proposals regarding the potential roles of IS within organizations (Table 2).

This third conception of IS strategy represents a higher order concept than the first two conceptions. Specifically, not only does this conception cover all three sub-domains (i.e., what, how, and who) of the management strategy of information systems proposed by Earl (1989), but it also suggests that IS-related decisions are contingent on the chosen role of IS (e.g., push or support business initiatives) agreed upon by the top

management.⁹ Therefore, this conception of IS strategy is *organization-centric*, which bridges the two extremes of business strategy-driven logic and IS function-driven logic in the two prior conceptions. An organizational perspective ensures that “all members of the organization are heading in the same direction” (Tai and Phelps 2000, p. 165) and consequently leads to “building some consensus regarding the role of IS vis-à-vis the rest of the firm and the resources that will be committed to achieving that role” (Pyburn 1983, p. 3). In this conception, the IS strategy is not necessarily dependent on a particular business strategy. For example, whether information systems are seen as a necessary evil or as leading edge may be independent of whether a company is following a differentiation or cost leadership business strategy (Parsons 1983). Meanwhile, the IS strategy should reflect the strategic view of the business executives regarding the role that IS should play (Armstrong and Sambamurthy 1999; Earl 1989; Galliers 2004; McLean and Soden 1977).

Conceptualizing IS strategy as a shared view of the IS role within an organization is also consistent with our definition of IS strategy presented earlier. Specifically, a shared view of the role of IS between the business and IS functions provides a basis to form the organizational perspective of how to invest in and utilize IS for strategic goals (Armstrong and Sambamurthy 1999; Preston and Karahanna 2009b). Due to the increasing information intensity in many industries, a greater number of business executives have gained an increasing appreciation for the potential of emerging technologies (McAfee and Brynjolfsson 2008). It is, therefore, highly possible that through a shared view between IS and business executives, the potential impact of new technologies could shape the business strategy of the organization (Galliers 1995). For IS researchers, we contend that understanding and categorizing the existing organizational perspectives (i.e., how the IS has been positioned within an organization) helps explain and predict the different strategic decisions that contemporary firms may make to leverage their resources to both support and enable business strategies (Earl 1989).

A limitation of this third conception of IS strategy is that it generally reflects a top-down perspective (i.e., the business and IS executives’ views) of IS strategy within an organization. However, some organizations might practice a bottom-

⁹It is possible that, in many organizations, there is lack of an agreement between the top business executives and IS executives on the role of IS. However, this third conception is not proposed to be a nominal strategy as we now see a greater level of shared understanding between business and IS executives on the strategic role of IS within the organization (for a good description, see Preston and Karahanna 2009a).

Table 2. Management's Views of IS Roles Within the Organization

Source	Suggested Roles of IS in the Organization
Parsons' generic IT strategy types (Parsons 1983); adopted by Kanungo et al. (2001) and Ward (1987)	Centrally planned, leading edge, free markets, monopoly, scarce resources and necessary evil
McFarlan's strategic grid (McFarlan et al. 1983; Nolan and McFarlan 2005); adopted by Ward (1987)	Based on current and future importance of IT for the business: strategic (high current/high future importance), factory (high/low), turnaround (low/high), support (low/low)
Dimensions of the strategy construct (Ragu-Nathan et al. 2001)	Aggressive promotion of IS; analysis-based development of IS; defensive management of IS; future-oriented development of IS; proactive management of IS; conservative management of IS
Schein's organizational IT visions (Schein 1992; Zuboff 1988); adopted by Tai and Phelps (2000)	Automate; informate up; informate down; transform
Szyperski's IS strategies (Szyperski 1981); adopted by Teubner (2007)	Momentum strategy; defensive strategy; moderate development strategy; aggressive strategy

up perspective to develop there is strategy. For example, in his book *The Savage Mind*, anthropologist Lévi-Strauss used the word *bricolage* to express his belief that in their potential all men are intellectually equal in generating knowledge. Based on this concept, Ciborra (1994) argues that strategic information systems need to evolve from the bottom-up, rather than being implemented from the top-down, so that such systems are less readily imitated due to their deeply rooted integration in a firm-specific organizational culture. In addition, Smith and Tushman (2005) propose an inside-out strategy, suggesting that firm executives need to constantly scrutinize the external environment for novel strategic opportunities.

A second limitation of conception III is that it currently has a less mature level of development within the literature and is therefore not well understood at this time. For example, we only identified nine articles categorized in this conception. Furthermore, within the literature, there is a lack of consistency across the various typologies for the role of IS proposed by the different authors. We also observed that the majority of the articles are descriptive in nature and the proposed typologies have not been empirically tested. For example, Parson's (1983) categories are not mutually exclusive, which creates a barrier in their application.

Nevertheless, conception III offers a new opportunity to study IS strategy as well as IS/business strategic alignment through a different lens. Because this conception of IS strategy assumes a shared understanding between the business and IS actors regarding the role of IS, it reflects the *social dimension* of IS strategic alignment (Preston and Karahanna 2009b;

Reich and Benbasat 1996, 2000), rather than the *intellectual dimension* that has been dominant within the prior IS strategic alignment literature (Chan and Reich 2007). Under this conception, strategic alignment is understood as an ongoing process dictated by the organization's top IS and business decision makers (Preston and Karahanna 2009a), rather than an outcome derived by its conformity with the organization's developed business strategy. In this case, IS strategy can be developed to either support or alternatively drive a business strategy allowing for a dynamic form of alignment.

Summary of the Three Conceptions of IS Strategy

The literature review suggests that the three conceptions that emerge from the IS strategy literature differ in terms of the contextual elements of the IS strategy (process, content, desired impact, and alignment). We observe that each conception has advantages and disadvantages with regard to its potential contributions to research and practice. While all three conceptions are valuable and useful for IS researchers to examine the concept of IS strategy, we propose that the third conception, IS strategy as a shared view of the IS role within an organization, has the highest potential to provide the most appropriate lens to extend future work within the domain of IS strategy.

First, conception III follows the paradigm of *perspective* (Mintzberg 1987) to define strategy at an organizational level, which is consistent with our general definition of IS strategy. We note that both conception I and conception II can be

recognized as a special case (or a subset) of conception III when some preconditions are missing. For example, when business executives' views of IS are dominant over that of the CIO in the formulation of strategic decisions (Kaarst-Brown 2005), the organizational perspective of IS basically reflects certain parts of business strategy (conception I). On the other hand, when non-IS executives' involvement in strategic IS decisions are minimal, organizational IS strategy will most likely become an enlarged version of IS functional strategy (conception II). The following quote from Galliers (1995, p. 52) affirms that an effective IS strategy must reflect the opinions from both business and IS sides:

However, it is still the case that organizations find difficulty in achieving success in their information systems strategy formation and implementation efforts. This is partly the result of a lack of awareness by [business] managers and their information systems colleagues: the former are often happy in the mistaken belief that information technology can be left to the technologist, and many of the latter are happier to have an information systems strategy and information systems development that are more concerned with technological issues than with business imperatives—with as little as possible involvement from business executives.

Second, the organization-centric view of IS strategy (conception III) may resolve these outlined issues of the other two conceptions. For example, conception I, which is business-centric, may not be highly relevant or explicit in a company where business strategy is not formally developed or in organizations where information systems are not viewed as strategically important. In addition, conception II, which is IS-centric, views IS strategy as a functional strategy, which may or may not be applicable at the organizational level and could create obstacles in the comprehension of strategic alignment (Preston and Karahanna 2009b).

Third, prior strategic leadership theories have argued that organizational choices are largely a function of the top management team's attitudes (Hambrick and Chen 1996; Hambrick and Mason 1984; Smith and Tushman 2005). Also, as described earlier, following an organizational perspective approach avoids the contradicting views on emergent versus deliberate strategies. Instead, such a conception suggests that an IS strategy could be both planned and emergent (Galliers 2004). Therefore, we suggest that conception III provides opportunities to advance research in the conceptualization and operationalization of IS strategy and also has empirical implications for the IS strategy-centered research streams identified earlier.

Proposing a New Typology of IS Strategy

Theoretical Underpinnings

Following our definition of IS strategy (presented at the beginning of this paper) and consistent with the third conception of IS strategy identified in the previous section (i.e., IS strategy as a shared view of the IS role within the organization), we propose a new IS strategic typology to operationalize IS strategy. This typology is established to close the gap in prior literature and provide a baseline to develop valid and holistic measures of the construct. Prior literature (McFarlan et al. 1983; Tai and Phelps 2000) has suggested that some companies view IS as an enabler for innovation, while others view IS as playing a supporting role to automate existing business processes. Based on this distinction, we contend that IS strategy can be operationalized in terms of a shared organizational perspective in which the firm seeks innovation through IS.

Swanson (1994) made a clear distinction between IS innovation and organizational innovation in general. Prior research suggests that the ultimate goal of IS innovation research is to provide guidance to managers on the question of whether, when, and how to innovate with IS (Fichman 2004; Swanson and Ramiller 2004). We wish to make it clear that IS innovation involves information systems (not just information technology) resources. It is certainly true that certain firms have been characterized as pioneers of IS innovation due to particular technologies that they introduce (e.g., Amazon's development of its proprietary collaborative technology); however, IS innovators are also represented by firms that apply novel approaches to leverage more mature technologies (e.g., Harrah Entertainment's initiatives to build business intelligence software into its slot machines).

Our proposal to operationalize IS strategy along the line of IS innovation is consistent with our earlier argument that IS strategy is not necessarily dependent on business strategy. In fact, there is a dearth of research that has examined IS innovation as an organizational level strategy. Within the existing works on IS innovation, researchers have generally focused on identifying the factors that explain the degree to which the innovative use of technologies occurs within an organizational setting (Li et al. 2006). In contrast to the extant literature, our conceptualization of IS strategy does not necessarily pertain to the actual usage of specific technologies. Rather, we emphasize an organizational perspective or mindset in which the firm is constantly seeking ways to innovate with IS resources.

Specifically, we suggest that, depending on the extent to which an organization has a perspective to pursue IS innovation, the IS strategic typology includes the following two types of defined IS strategies: IS innovators and IS conservatives. In addition, there is a third type of organization that has an undefined IS strategy. The theoretical basis for this typology is grounded in the framework of explorative/exploitative capability in the organizational learning literature (He and Wong 2004; March 1991; Piccoli and Ives 2005). March (1991, p. 85) defines *exploration* as “experimentation with new alternatives that have returns that are uncertain, distant, and often negative” and *exploitation* as “the refinement and extension of existing competencies, technologies, and paradigms.” As such, firms engaging in exploration seek new organizational possibilities through innovation while firms engaging in exploitation seek to refine and bolster existing processes and capabilities (Cheng and Van de Ven 1996; Ghemawat and Costa 1993; He and Wong 2004; Wade and Hulland 2004). Based on these arguments, we posit that the IS innovator represents an organizational perspective to continuously seek to be innovative through *new* IS initiatives while the IS conservative represents an organizational perspective to create value through effectively refining and improving *existing* IS practices. In addition, we posit that an organization characterized by an undefined IS strategy does not have an articulated approach toward either explorative or exploitative use of IS. Below, we briefly describe each IS strategy type.¹⁰

A primary goal of the IS innovator is to be an IS leader within its industry. As such, the IS innovator seeks to be the first in its industry to respond to the opportunities through which it can explore, develop, and capitalize on innovative IS initiatives for its benefit. Piccoli and Ives (2005) argue that researchers should view IS strategy in terms of a perspective rather than a few discrete decisions regarding the strategic use of IS. As such, it is important to note that an IS innovator is not always the first to introduce or adopt every new technological innovation and may not always be on the “leading edge” in every sector of technology. Rather, the IS innovator has a consistent strategic perspective in which it is constantly engaged in seeking ways to innovate with IS and to be an IS leader over its competitors. For instance, Dell Computer, Wal-Mart, and Harrah’s Entertainment have all been noted as IS leaders in their respective industries because they all consistently pursue an innovative IS strategy that is essential to the current and future success of the firm (Piccoli and Ives 2005).

¹⁰We acknowledge that it is debatable whether an undefined strategy is actually a type of strategy or not. However, such a debate is not within the scope of this study.

The IS conservative, in contrast to the IS innovator, seeks a more stable approach with regard to IS strategy. An IS conservative does not wish to establish itself as an IS leader nor does it actively look to be the first in its industry to develop new IS initiatives. Rather, the IS conservative seeks to exploit IS innovations only after they are carefully scrutinized. In other words, although the IS conservative is interested in reaping the potential benefits of IS, in order to reduce potential risks of engaging in an aggressive IS strategy, it generally does not adopt new IS innovations unless they have already been proven to be beneficial for its competitors. It is possible that, under certain circumstances, an IS conservative may be the first to adopt and use certain technologies and/or practices; however, its overall perspective is to adhere to a conservative approach to exploit IS for strategic purposes. We note that a conservative strategy could be an effective strategy for many companies. An example of an IS conservative that has benefitted from its IS strategy is Sprint Nextel. Since the merger between Sprint and Nextel was completed in 2005, this newly established company has focused on reconfiguring its existing IS resources to reduce operating costs and improve efficiency and has consequently yielded higher levels of performance through such practices (LeFave et al. 2008). In addition, as part of the current study, we interviewed the CIO of a large U.S.-based hospital to provide insight into this phenomenon. This CIO indicated that in general the hospital’s perspective is not to develop or employ any new IS initiatives until it observes a proven record of success by its competitors even if there are immediate strategic needs that could potentially be addressed by these technologies.

An organization with an undefined IS strategy, in essence, does not have clear long-term IS goals nor does it have a consistent pattern of behavior regarding its IS strategy. Such an organization cannot clearly pinpoint its IS strategy but views IS strategy more as an afterthought. As we have discussed, such an organization does not strategize about utilizing IS for either explorative or exploitative goals. According to a survey by *CIO* magazine (Slater 2002), 39 percent of American companies do not have a formal IS strategy at all.

We note that, although by definition the IS strategies we described above suggest they are mutually exclusive, it is possible that some organizations may exhibit both explorative and exploitative behaviors related to IS to some degree. In fact, prior research has argued that organizations should seek to be ambidextrous by maintaining balance between exploration and exploitation (Galliers 2006a; March 1991). Some researchers have also emphasized the need for ambidexterity by implying that firms that engage in both high degrees of exploitation and exploration can derive higher levels of performance than those with other combinations (Atuahene-Gima and Murray 2007). However, despite the arguments for

ambidexterity, we contend that such an approach may not be feasible for many organizations. Levinthal and March (1993, p. 105) state that “the precise mix of exploitation and exploration that is optimal is hard to specify.” Prior research has noted that few studies have found that organizations have the capability to be ambidextrous (He and Wong 2004). Most organizations have great difficulty operating in an ambidextrous manner and therefore cannot fully concentrate their focus to both be highly efficient and highly innovative (Abernathy 1978; Benner and Tushman 2003; Galliers 2004, 2006a; Ghemawat and Costa 1993; March 1991; O'Reilly and Tushman 2004; Smith and Tushman 2005). Nerkar (2003) has argued that for a firm to enhance its performance it should balance its learning processes by coupling a high level of focus on exploration with a low level of focus on exploitation or vice-versa. As such, we argue that the two defined IS strategy types (i.e., the IS innovator and IS conservative) we proposed are mutually exclusive in that an organization could have an explicit or implicit IS strategy that fits into one of these strategic types. In addition, we suggest that a firm should primarily focus on either exploratory or exploitative use of IS as both strategies could be effective. In other words, the overall mindset of the organization should be focused on being an IS innovator or an IS conservative.

Development of Is Strategy Measures

To further examine the nature of these IS strategies and to provide a means to operationalize these strategies for future research, we developed multi-item scales for measuring each of these IS strategic types. The description of the process of scale development is provided in Appendix D. The resulting instrument is presented in Table 3.

These measures of IS strategy represent an agreed upon organizational perspective among both the organization's CIO and its business executives. As described in Appendix D, we conducted an exploratory factor analysis using the responses to the above measures from both the CIO and top business executives from 174 U.S.-based organizations to assess the psychometric properties of the scales in terms of item loadings and discriminant validity. The results suggest that the CIOs and the business executives are consistent in their assessment of the organization's IS strategy. The significant factor loading coefficients confirm the convergent validity of the three types of IS strategies. We observe that both the CIO and business executives can clearly attribute their organization's IS strategy to that of an IS innovator, IS conservative, or realize that their firm has an undefined IS strategy. Specifically, we observe that all the items developed to respectively measure innovator, conservative, and undefined strategy load

highly on their target constructs and were assessed similarly by both the CIOs and business executives. In addition, we observe minimal cross-loadings of these items, which provides support that these IS strategies are mutually exclusive.

In sum, a total of nine items loaded onto the three types of IS strategy providing support for construct validity of the measures as well as demonstrating a common structure of three distinct IS strategies. These results provide the statistical legitimacy for the use of the items to directly measure the three types of organizational IS strategy. Furthermore, the results of the factor analysis allowed us to cross-validate the instrument across the two key groups of the CIOs and the business executives. As such, our instrument can be readily used for future research by surveying either IS executives or business executives to directly measure the organization's IS strategy.

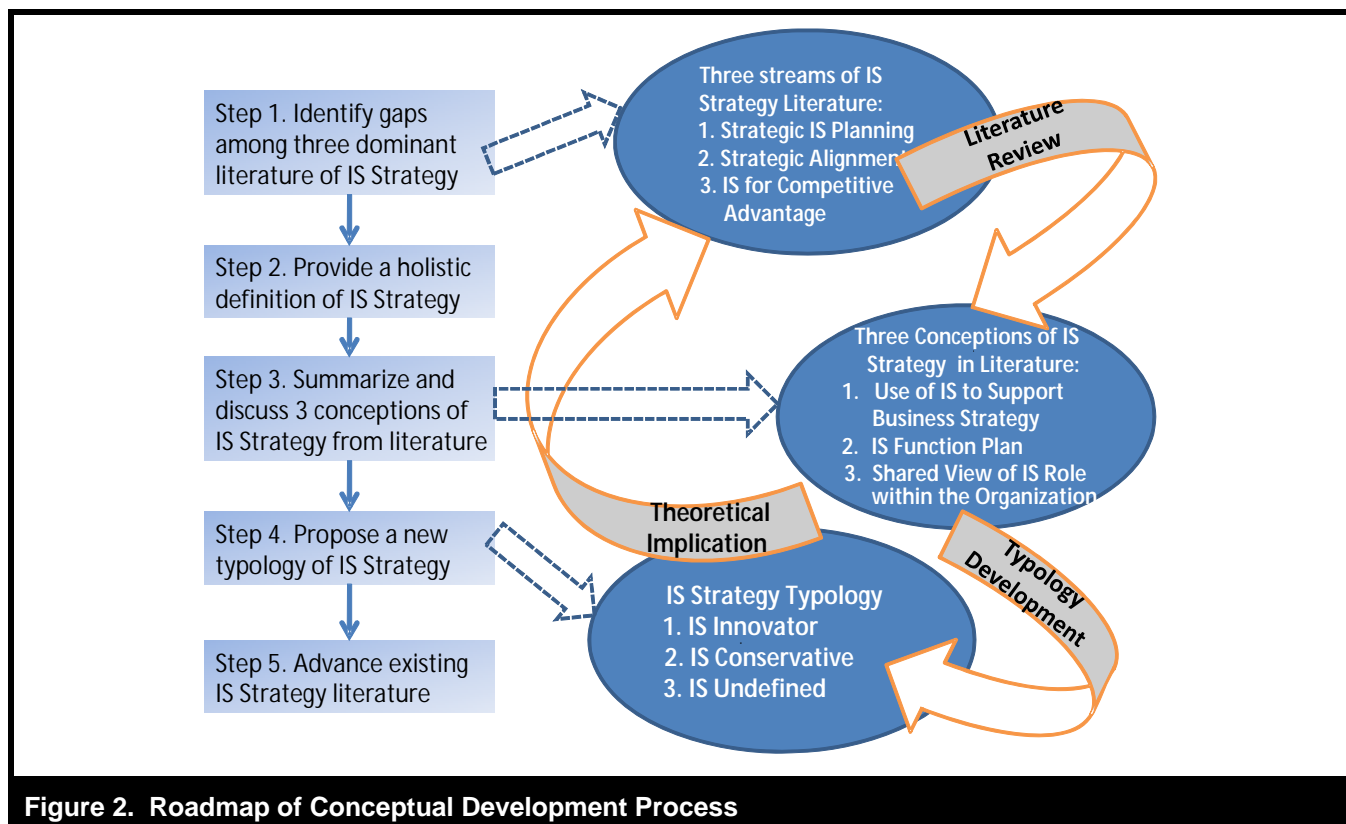
Theoretical and Practical Implications

At the beginning of this paper, we described three closely related streams of literature (i.e., strategic information systems planning, IS alignment, and IS for competitive advantage) that are all centered on the concept of IS strategy. As we have noted, due to the ambiguity of the definition of IS strategy within prior research, there are key limitations within the extant literature that warrant further attention. In order to advance future work in IS strategy, drawing upon strategic management literature, we have provided a holistic definition of IS strategy by conceptualizing IS strategy as an organizational perspective of strategic innovation. Following this definition, we conducted a systematic review of the IS strategy literature and identified three dominant conceptions of IS strategy that emerged from the literature. Based on the analysis of these three conceptions, we developed and proposed a new typology of IS strategy. In this section, we discuss the theoretical and practical implications of our proposed IS strategy typology to the extant research within the three predominant literature streams outlined previously and develop actionable propositions within each research stream. A roadmap that portrays the conceptual development process of this research study is provided in Figure 2.

In our following discussion, we dedicate our focus on the two defined IS strategy types, IS innovator and IS conservative, because both are actionable strategies. Therefore, we believe a deeper analysis of these two strategies provides imperative opportunities to extend existing literature related to IS strategy. In addition, companies that choose either of these two

Table 3. IS Strategy Typology Scales

IS Innovator	
Innovator1:	Our organization is a leading IS innovator in our industry.
Innovator2:	Our organization believes in being first in the industry in developing new IS initiatives even if not all of these efforts prove to be highly profitable.
Innovator3:	Our organization responds rapidly to early signals concerning areas of opportunity for IS.
IS Conservative	
Conservative1:	Our organization follows a safe and stable approach to developing new IS initiatives.
Conservative2:	Our organization adopts promising IS innovations once these initiatives have been proven in our industry.
Conservative3:	IS innovations are carefully examined before they are chosen by our organization.
Undefined	
Undefined1:	Our organization does <i>not</i> have definitive long-term IS goals.
Undefined2:	Our organization does <i>not</i> have an articulated IS strategy.
Undefined3:	Our organization does <i>not</i> have a consistent pattern of behavior regarding IS.
Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree	

**Figure 2. Roadmap of Conceptual Development Process**

strategy types can be characterized as mindful organizations. Swanson and Ramiller (2004) argue that a mindful organization addresses IS innovation based on a grounded understanding of its own specific organizational situation. Consequently, mindful organizations are more likely to reach a shared organizational perspective and the strategy they pursue is more likely to have meaningful implications to organizational outcomes. In contrast, an organization with an undefined IS strategy, by definition, appears to be representative of a “mindless” organization since this type of organization has an undefined and/or inconsistent IS strategy. It is improbable that a mindless organization would consistently outperform its competitors. Furthermore, it is less interesting to study and to attempt to predict the behavior of such mindless organizations that lack an actionable IS strategy. As such, our formal propositions are developed for the two IS strategies that mindfully seek exploration or exploitation of IS.

Implications for Strategic Information Systems Planning (SISP) Literature

The SISP literature focuses on the “strategizing” processes of information systems investment decisions (Galliers 1991; Premkumar and King 1994). However, a key problem of this line of research is that the concept of IS strategy is largely ignored.¹¹ The lack of a clearly defined IS strategy concept might explain why there has been an inconsistent understanding of how to assess the processes and outcomes, or “means” and “ends” (Prekumar and King 1994), of strategic IS planning.

Prior research (Segars and Grover 1999; Segars et al. 1998) has conceptualized SISP along several dimensions including focus (creativity versus control); formalization (formal versus informal guidelines); and flow (top-down versus bottom-up). In particular, focus refers to the balance between creativity and control orientations inherent within the strategic planning process (Chakravarthy 1987). Strategic planning, therefore, emphasizes either creativity or control (Byrd et al. 1995; Chakravarthy 1987; Sabherwal and King 1995; Segars et al. 1998). Formalization, another dimension, refers to the existence of and adherence to structures, techniques, written procedures, and policies that guide the planning process (Lederer and Sethi 1996; Segars and Grover 1999; Segars et al. 1998). Last, flow is based on the locus of authority for strategic planning and is typically described as top-down (i.e., from higher corporate levels to lower levels within the

organization), or bottom-up (i.e., from lower levels to higher levels of management) (Chakravarthy 1987; Segars and Grover 1999; Segars et al. 1998).

Furthermore, strategic planning success implies that the firm has the capability to effectively focus on creativity or control as part of the strategic planning process (Dennis et al. 1997). By definition, it is reasonable to conclude that the exploratory nature of the IS innovator strategy focuses on creativity and seeks to promote the generation of innovative technologies and novel approaches to utilize IS resources while the exploitative nature of the IS conservative strategy focuses on control (Philip 2007). Interestingly, in terms of the other two dimensions (i.e., formalization and flow), the picture may not be clear and is, therefore, worth further examination. We have noted earlier that one of the limitations of conception III of IS strategy that emerged from prior literature (i.e., a shared organization view of the IS role) is that it generally reflects a formalized and top-down approach of IS strategic development. Although following the spirit of conception III, the IS strategy typology proposed in this study acknowledges that both the IS innovator and the IS conservative may take either a formal versus an informal approach as well as a top-down versus a bottom-up approach in its strategic planning process. For this reason, we suggest that an analysis on the effect of the level of formalization and nature of the IS strategic process flow needs to consider whether a particular IS strategy is focused on creativity or control.

We first examine *formalization* in conjunction with *focus* of the strategic planning process. We contend that the level of formalization of the strategic planning process will have different implications for the IS innovator and the IS conservative. Researchers have argued that a more formalized planning process allows for greater gains in efficiency and control; however, such gains in efficiency accrued from a formalized process may compromise strategic flexibility and creativity (Dawes et al. 1999; Segars and Grover 1999; Segars et al. 1998). Specifically, formalized planning is better designed to allow for more efficient routines and processes and provide incremental improvements in organizational outcomes (Benner and Tushman 2003; Jansen et al. 2006). Meanwhile, formalized rules and procedures tend to stifle experimentation and thereby constrain exploratory innovation (Jansen et al. 2006). In addition, the level of uncertainty that surrounds a focus on creative and innovative processes can make extensive formal planning counterproductive because creativity highlights the importance of maintaining flexibility and informal networks to support spontaneity through improvisation (Dewett and Williams 2007). On the other hand, informal relationships allow individuals in the planning process to develop legitimacy and trust, which are essential

¹¹Please refer to Galliers (2004) for a comprehensive review of the development of the SISP literature.

for exploratory innovation (Subramaniam and Youndt 2005). Furthermore, prior research suggests that decision makers scanning for innovative ideas prefer information from personal contacts rather than from a formalized channel (Geletkanycz and Hambrick 1997). Therefore, an exploitative strategy is better suited for a variety of formalized planning approaches while an exploratory strategy will make use of informal and unconventional planning approaches to enable the actions of strategic visionaries within the organization (Philip 2007). Thus,

Proposition 1a: For IS innovators, the use of a less formalized approach will be positively associated with IS strategic planning success.

Proposition 1b: For IS conservatives, the use of a more formalized approach will be positively associated with IS strategic planning success.

We also examine *flow* in conjunction with *focus* within the strategizing process (Galliers 2006b). For the IS innovator, a focus on creativity allows for the systematic generation of innovative or novel solutions for competitive implications (Segars et al. 1998). An innovative firm is one that pursues a strategy that deviates from the central tendencies of the industry and as such departs from strategic conformity (Finkelstein and Hambrick 1990; Geletkanycz and Hambrick 1997). However, most organizations are constrained by levels of inertia and tend to generally be committed to the organizational status quo, which compromises the development of innovative strategies (Geletkanycz and Hambrick 1997; Ghemawat 1991; Stiles 2001). An important lens to examine the appropriate flow of the strategizing process through an exploratory versus an exploitative means is the role of knowledge flow (through a top-down or bottom-up approach) (Mom et al. 2007) in promoting strategic innovation.

There is some prior research that would support the argument that a top-down approach is well suited for an IS innovator since top management operates in a social context that spans organizational boundaries in which extra-industry ties provide managerial awareness of different strategic alternatives and thereby prepare an organization to pursue an innovative and nonconformist strategy (Atuahene-Gima and Murray 2007; Geletkanycz and Hambrick 1997; Hambrick and Mason 1984; West and Anderson 1996). However, there is also a strong theoretical basis in the literature that suggests that a bottom-up approach, through which managers internal to the organization influence the dissemination of knowledge, is most essential to strategic innovation. Extant research has asserted that exploration is generally associated with organic structures, loosely coupled systems, path breaking, improvisation,

autonomy, and chaos, while exploitation is generally associated with mechanistic structures, tightly coupled systems, path dependence, routinization, and control and bureaucracy (Brown and Eisenhardt 1997; He and Wong 2004; Lewin et al. 1999). Front-line managers are often the most likely organizational members to directly encounter unforeseen problems, changing market conditions and customer demands, and the need for new technological developments (Mom et al. 2007; Sheremata 2000). A bottom-up planning flow may be necessary to offset the “bounded rationality” of top managers, who may not be exposed to and consequently may not understand the complexity and dynamic nature of internal working processes at various levels of the organization (Das et al. 1991; Sabherwal and King 1995; Segars and Grover 1999). Knowledge inflows transferred from the bottom to the top of a vertical hierarchy tend to be *ad hoc*, random, and unpredictable and thereby facilitate rich reciprocal interactions and knowledge sharing between members of an organization. As such, bottom-up inflows of knowledge facilitate exploration activities through the vertical hierarchy (Burgelman 1983; Mom et al. 2007) and provide higher level managers with a better understanding of how emerging IS initiatives can be used to address strategic problems. Therefore, bottom-up knowledge inflows can be a major source of exploratory learning throughout the vertical hierarchy that allow organizational members to develop, experiment with, and redefine strategic decisions (Brady and Davies 2004; Floyd and Lane 2000). Based on the above discussion, we suggest that a bottom-up approach to the strategic planning process may be the best means for the IS innovator to discover new opportunities and establish innovation as an important part of the IS strategy.

The IS conservative, which focuses on control, needs to engage in an integrative approach to assess opportunities based on the existing resource structures and processes of the organization for avenues of competitive exploitation (Segars and Grover 1999). Although top management can design the organization’s level of exploration by influencing organizational culture or by altering the organization’s structure, the vertical flow of knowledge from top to bottom may be more appropriate to facilitate exploitation (Mom et al. 2007) because a top-down approach reflects a centralized locus of decision-making authority and a narrower channel of communication within the organization (Cardinal 2001; Jansen et al. 2006). Such centralization restricts the quantity and quality of ideas and knowledge for non-routine problem solving and experimentation among individuals, consequently limiting efforts in exploratory innovation (Damanpour 1991; Jansen et al. 2006). Knowledge that flows from higher levels of the organizational hierarchy downward tends to be unambiguous and technical in terms of content, which is more appropriate

for exploitation activities within the organization (Mom et al. 2007). In addition, a strategy focusing on control is typified by budgetary concerns initiated by the top management, such as resource allocation, cost-performance considerations, and controlled diffusion of technology within the organization (Segars et al. 1998). Thus, we propose that a top-down approach may be more applicable to IS conservatives. Stated formally,

Proposition 1c: For IS innovators, the use of a bottom-up approach will be positively associated with IS strategic planning success.

Proposition 1d: For IS conservatives, the use of a top-down approach will be positively associated with IS strategic planning success.

Implications for IS Strategic Alignment Literature

As we described earlier, the more dominant paradigm within the extant IS/business strategic alignment literature is the intellectual dimension of alignment, of which the underlying assumption is that an organization that aligns its IS strategy with its business strategy will derive a greater strategic use from IS, thereby leading to greater performance (Chan and Reich 2007; Chan et al. 2006). Although prior research has provided evidence to support this theoretical argument, the conceptualization as well as the operationalization of IS strategy and therefore IS strategic alignment have several limitations.

Specifically, many of the extant research studies of the intellectual stream of alignment (Chan and Reich 2007; Chan et al. 2006; Croteau and Bergeron 2001; Oh and Pinsonneault 2007; Sabherwal and Chan 2001) attempt to identify a certain IS strategy that must fit with a particular given business strategy (Ravishankar et al. 2010). Consequently, the concept of IS/business strategic alignment reflects a static outcome. Methodologically, we observe the IS strategy profiles in several studies (e.g., Chan et al. 1997; Chan et al. 2006; Sabherwal and Chan 2001) were developed to conform to a particular business strategy type assuming an ideal form of alignment. For instance, Chan and her colleagues (e.g., Chan et al. 1997; Chan et al. 2006; Sabherwal and Chan 2001) developed IS strategy profiles (IS for effectiveness, IS for flexibility, and IS for comprehensiveness) based on system usage that were subsequently mapped onto a particular business strategy operationalized using the Miles and Snow (1978) typology to assess alignment. In another study, Oh and Pinsonneault (2007) defined IS-business alignment as the

extent to which an organization's portfolio of IS applications is aligned with its business objectives with an assumption that a firm's IS strategy is reflected in the pattern of the firm's deployment of its IS applications. In addition, Tallon (2007) viewed IS alignment as the degree to which the use of IS supports specific business processes. Within this intellectual paradigm, the measurement of IS strategy is based on the use of information systems within the organization. As such, IS strategy is operationalized at a systems or applications level rather than at the organizational level. Furthermore, the IS strategy examined in this research stream is notably a "realized" strategy that does not reflect strategy as an organizational perspective (Mintzberg 1987) as we described earlier.

Due to its static nature, the assumption that IS strategy should conform to the organization's business strategy has recently been questioned (Chan and Reich 2007; Galliers 2004, 2006a, 2006b; Tallon 2007). For example, researchers have argued that alignment is not a state but a journey that cannot always be tightly planned (Chan 2002; Chan and Reich 2007; Ciborra 1994). Chan and Reich (2007) contend that tightly coupled plans may have deleterious outcomes in a turbulent business environment since such interlocking plans will likely have a slower reaction when adjusting to their new environments. Through a punctuated equilibrium model, Sabherwal et al. (2001) argue that the IS alignment goes through cyclical phases of stability and instability, thus necessitating a dynamic approach to alignment. As noted by Galliers (2006a, p. 227), "the dynamic nature of the competitive, collaborative, and regulatory environments in which organizations conduct their business, dictate that constant and careful attention should be paid to the ever-changing nature of information need." In summary, the potential "rigidity trap" establishes the need for a more dynamic approach between the business strategy and IS strategy.

Despite the importance of understanding the dynamic nature of alignment, there is a paucity of research in this domain (Sabherwal et al. 2001). As the business environment is constantly changing, there may actually be no true "state" of alignment (Chan and Reich 2007). Researchers have recently argued that a preferred goal for the organization is the coevolution between the IS strategy and business strategy through which both strategies develop iteratively and reciprocally over time (Agarwal and Sambamurthy 2002; Preston and Karahanna 2009b). As such, at some juncture an organization's business strategy may lead the IS strategy while at another point the IS strategy may lead the business strategy.

The IS strategy profiles provided in the current study (manifested as an IS innovator or IS conservative) follow the social dimension of IS strategic alignment (Preston and Karahanna

2009a; Reich and Benbasat 1996, 2000), which has been recognized as offering a more comprehensive lens to examine the interrelationship between IS strategy and business strategy (Chan and Reich 2007). Prior research has found that the shared CIO/TMT vision of IS (similar to the conceptualization of IS strategy in the current study) directly facilitates the alignment between the IS and business strategy (Preston and Karahanna 2009a; Reich and Benbasat 1996, 2000). Our conceptualization of IS strategy as an organizational perspective suggests that the IS strategy that an organization pursues does not have to map onto a particular type of business strategy. More importantly, we contend that our proposed IS strategic typology may provide insights about determining whether and when the IS strategy is driven by or drives the business strategy.

We posit that the IS conservative and IS innovator strategies may interact with the overall business strategy differently. In particular, the idiosyncratic way through which each IS strategy interacts with the business strategy could be recognized based on the principles of the exploitation/exploration framework (March 1991). As we have discussed, the IS conservative, which seeks to exploit existing IS resources, cautiously observes the business environment and assesses its own capabilities before initiating any strategic moves with IS. As such, following this stable approach, the IS conservative may benefit if it allows the IS strategy to be driven by the business strategy. For example, when enterprise resource planning (ERP) systems first emerged, many organizations found it difficult to assess the potential value of these systems due to the complexity associated with these systems as well as their implications for business processes (Davenport 1998). Organizations that were unsure how to generate value from this large-scale innovation would benefit by allowing the business strategy to drive the IS strategy since ERP may not be a “silver bullet” for all organizations (Gattiker and Goodhue 2005). Prior literature has suggested that a key aspect of ERP alignment is the clarity of the ERP objectives for the business (Brown and Vessey 2003). On the other hand, it would be problematic for the IS conservative if the IS strategy were to lead the business strategy, because by its nature the firm would have limited ability to explore and scrutinize IS innovations or opportunities in the market.

In contrast, the IS innovator is poised to have IS strategy as its strategic driving force. As discussed earlier, the traditional model of alignment, in which IS strategy lags the business strategy, may not be well suited for more innovative needs (Agarwal and Sambamurthy 2002; Burn 1996; Henderson and Venkatraman 1992). Such an approach constricts the organization's outlook and inhibits its ability to be a change leader (Miller 1996; Sabherwal et al. 2001). Experimentation, an

important step for innovation, requires that organizations do not adhere to existing business practices but seek to create new capabilities for the organization (He and Wong 2004). As such, due to the exploratory nature of the IS innovator, this organization will be required to develop and institute IS strategies based on the opportunities presented by the external environment or proposed internally on an *ad hoc* basis rather than on a predetermined business strategy. For a firm that seeks to be an IS leader in its industry, it will be necessary for the IS strategy to be at the forefront of all other strategic initiatives, which must follow in tow. For instance, Cooper et al. (2000) reported that First American Corporation sought to change its business strategy from a traditional banking approach to a customer-oriented approach to make it a leader in the financial services industry. This strategic transformation at First American Corporation was dependent upon the innovative usage of a data warehouse. In this case, we observe that an innovative IS strategy was required to enable this business strategy. Thus, stated formally,

Proposition 2a: For IS innovators, IS strategy is well positioned to drive business strategy.

Proposition 2b: For IS conservatives, business strategy is well positioned to drive IS strategy.

Implications for IS for Competitive Advantage Literature

The IS strategic typology proposed by this study has important implications for the IS for competitive advantage literature. In this section, we distinguish between the linkages from IS strategies to competitive advantage and from IS strategies to firm performance because competitive advantage and firm performance are two distinct organizational outcomes. We first analyze the association between different IS strategies and competitive advantage. Prior research has argued that the degree to which a firm will prosper from a first-mover advantage in part depends on the extent to which the firm possesses the skills and resources that can be employed to generate organizational processes that enhance the potential for this strategy (Kerin et al. 1992). A key myth in the IS literature is that the investment in IS resources alone can yield a competitive advantage (Galliers 2004, 2006a). The resource-based view (RBV) of the firm, established by Barney (1991), provides a theoretical basis from which IS researchers can examine the competitive advantage derived through IS capabilities (Wade and Hulland 2004). IS capability refers to an organizational ability to mobilize and deploy IS resources in combination or coexistent with other organizational resources and capabilities (Bharadwaj 2000).

In accordance with RBV, an organization's ability to capitalize on valuable, rare, and inimitable IS capabilities, rather than merely its investment in IS resources, determines whether the organization can achieve competitive advantage.

As such, organizations that continually pursue IS innovation are more likely to create and capitalize on unique IS capabilities that may potentially allow these firms to gain competitive advantage over their industry competitors (Li et al. 2006; Mata et al. 1995). In contrast, firms that follow the established best practices of industry leaders (i.e., IS conservatives) limit their ability to create the new knowledge needed to be responsive to the imperatives dictated by the environment (Galliers 2006a, 2006b). As such, through a safe and stable approach, the IS conservative essentially cedes the opportunity to derive competitive advantage through IS because their chances of building something new and rare are unlikely.

Proposition 3a: IS innovators will have a greater level of association with firm-level competitive advantage than IS conservatives.

Despite the promise of IS innovation for competitive advantage, the support for the link between IS innovation and firm performance has been observed to receive mixed results. This finding is not surprising because, while the IS innovator strategy is more likely to bring competitive advantage to a firm, such strategy is also more costly and thus more risky than the IS conservative strategy. Stated differently, the potential benefits and risks for a firm that pursues an aggressive IS strategy are contingent upon its ability to carry out that strategy successfully (Galliers 2004). We argue that an organization that pursues an innovative strategy (i.e., an IS innovator) needs to ensure that it can support this strategy, otherwise it is unlikely that the organization will derive a positional advantage relative to its competitors (Cooper 1979; Day 1990; He and Wong 2004; Kerin et al. 1992). Although the goal is to gain a competitive advantage through innovative use of IS, the IS innovator strategy also carries greater risks of failure, which can lead to adverse financial and organizational outcomes (Leidner and Mackay 2007). Therefore, organizations that are not well positioned to be an IS leader may benefit from taking a position as an IS conservative.

We posit that the IS conservative strategy is not necessarily inferior to the IS innovator strategy in terms of the impacts to business performance. By assessing the competitive moves of the IS innovators in the industry, the IS conservative is able to gauge the technology successes and failures of these IS leaders and adjust its own IS strategy accordingly. Also, through a focus on providing efficient and cost-effective IS

operations, the IS conservative should be adept at reducing system failures and managing the appropriate IS quality and reliability for the organization, all of which can have an impact on firm performance (Bharadwaj 2000; Ross et al. 1996; Wade and Hulland 2004). Although the IS conservative may not likely yield a similar level of competitive advantage from IS as a successful IS innovator, this strategy may enable the firm to constantly derive returns from IS while hedging strategic risks. As such, IS innovators are more likely to have both greater levels of success as well as more pronounced failures than more cautioned IS conservatives (Benner and Tushman 2003; Burgelman 1994; Lieberman and Montgomery 1998). Thus, stated formally,

Proposition 3b: IS innovators will be associated with higher levels of firm-level performance variation than IS conservatives.

Since most firms compete in a fast changing environment, any analysis on the implication of a particular competitive strategy is incomplete without considering the effect of competitive environment. The external environment plays a critical role in determining the IS strategy an organization should pursue (Finnegan et al. 1998). Environmental uncertainty, dynamism, and turbulence are all terms that relate to the rate of unpredictable change in a firm's environment (Lumpkin and Dess 2001). A hyper-competitive environment provides both challenges and opportunities for firms to develop the right strategy and establish favorable competitive positions. Therefore, environmental turbulence may also play a key role in explaining how IS strategy influences the ability of the firm to create a competitive advantage. Some prior research has argued that complex and turbulent environments warrant a "simple strategy" approach (Eisenhardt and Sull 2001), rather than complex strategy such as innovation. On the other hand, extant research has suggested that firms have the incentive to pursue more aggressive strategies and to be more innovative as the external environment becomes more uncertain and complex (Freel 2005; Miller and Friesen 1982; Ozsomer et al. 1997).

With regard to IS strategy, we contend that a turbulent environment is conducive to IS innovation rather than stability since the ability of an organization to rapidly develop new technological capabilities is essential in an environment characterized by dynamic change (Benner and Tushman 2003; Brown and Eisenhardt 1997). Uncertainty within the external environment increases the organization's need for information processing and therefore increases the level of strategic importance of the organization's information systems (Chan et al. 2006; Daft and Lengel 1986; Galbraith 1977). McAfee and Brynjolfsson (2008) argue that in a Schumpeterian

environment, the potential value of process innovations enabled by information systems greatly multiplies, which places greater pressure on senior management to promote IS strategic innovation. Furthermore, Li and Ye (1999) argue that a dynamic environment may prompt firms to pursue a preemptive strategy to capitalize on the potential benefits of IS and gain competitive advantage. On the other hand, a stable environment will favor organizations that sustain incremental innovation and focus on efficiency rather than those seeking more variance-increasing innovations (Benner and Tushman 2003). Stated differently, firms in more stable environments may prefer to exploit existing knowledge and capabilities rather than explore new possibilities (Leonard-Barton 1992; Levinthal and March 1993; Levitt and March 1988; Wade and Hulland 2004). Prior literature has shown that the dynamic state of the external environment may influence the degree to which IS capabilities impact firm performance (Freel 2005; Kerin et al. 1992; Li and Ye 1999; Wade and Hulland 2004). In a dynamic environment, the firm must be agile to capitalize on the opportunities that arise quickly and potentially disappear at an equally fast rate. We argue that an IS innovator has a greater chance of capitalizing on these potential opportunities that arise in such dynamic environments. Thus, we suggest,

Proposition 3c: In a turbulent environment, IS innovators will be associated with higher levels of firm-level performance than IS conservatives.

Limitations

Now that we have outlined the potential implications of our research to the literature related to IS strategy, we wish to note that the current study has several limitations. First, although we have justified and defined IS strategy in terms of a shared organizational perspective regarding the strategic role of IS within the organization, we acknowledge that the conception of IS strategy that we adopt is one of many that could be potentially applied to future IS strategy research. Second, there may also be some limitations that apply to our proposed IS strategy typology and the respective measures that were developed. We assume that the IS strategy types are mutually exclusive, which is indeed supported by our data analysis (Appendix D). However, the degree to which these IS strategy types are mutually exclusive could potentially be brought into question and warrants further empirical examination. Third, while we have also developed propositions based on our IS strategy typology to advance the three major research streams related to IS strategy (i.e., SISF, IS strategic

alignment, competitive use of IS), a limitation of these propositions is that only general insight has been provided for each of these research streams. Furthermore, we develop our propositions only for organizations that have a definitive IS strategy. Future research should seek to understand why certain organizations have an articulated IS strategy while the IS strategy of other organizations is undefined. Finally, we have not empirically tested these propositions. As such, following the exploratory effort of the current study, additional research is warranted to extend this body of knowledge. We suggest future empirical research should design a more granular approach to develop specific testable hypothesis in a real world setting.

Conclusion

Our investigation has shown that prior IS strategy research has led to different implicit conceptions of IS strategy along with different content proposals. Bringing these proposals together raises questions on contingencies of IS strategy and the relationships between the outcomes of decisions that make up the content. Through the conceptualization and measurement of IS strategy provided in this study, there are substantial implications for both research and practice. This article provides an intellectual basis for examining IS strategy and has developed propositions for each of the three major research streams closely centered on the IS strategy construct. We believe that identifying different conceptions among the existing literature, as well as posing propositions based on contingencies and relations within the extant literature will spur a new discussion on IS strategy that will contribute to the field of IS in a similar way that business strategy has benefitted from similar discussions.

This study also introduced and validated a means to directly measure IS strategy. These measures, which were cross-validated across both CIOs and senior business executives, have the potential to serve as a diagnostic tool through which future researchers can directly assess the organization's IS strategy as a shared dynamic perspective of IS innovation. In terms of practice, the IS strategy typology provides a framework for both IS and business executives to understand their current IS strategy and how they should further pursue their IS strategy. By understanding that the focal point of alignment is a shared view (among the organization's top decision makers) of the role of IS within the organization, executives are empowered to develop this collective viewpoint. In addition, this study provides guidelines for business executives to examine the strategic planning process, the dynamic interplay between IS strategy and business strategy, and the impacts derived from IS strategy.

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INFORMATION SYSTEMS STRATEGY: RECONCEPTUALIZATION, MEASUREMENT, AND IMPLICATIONS

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Appendix A

Definitions of IS Strategy Related Terms in Literature

Term Used	Definition Provided	Source
I/T strategy	None provided	Henderson and Venkatraman 1999
Information Management Strategy	"A long-term precept for directing, implementing and supervising information management" (information management left undefined)	Reponen 1994 (p. 30)
	"Deals with management of the entire information systems function," referring to Earl (1989, p. 117): "the management framework which guides how the organization should run IS/IT activities"	Ragu-Nathan et al. 2001 (p. 269)

Term Used	Definition Provided	Source
Information plan	Tangible outputs of the SISP process	Brown 2004; Lederer and Salmela 1996
Information strategy	"A complex of implicit or explicit visions, goals, guidelines and plans with respect to the supply and the demand of formal information in an organization, sanctioned by management, intended to support the objectives of the organization on the long run, while being able to adjust to the environment"	Smits et al. 1997 (p. 131)
Information system(s) strategy, IS strategy	A comprehensive plan that includes the following components	Bajjalay 1998; Galliers 1991
	None provided; defines only <i>strategic information systems</i> , a term that is used synonymously: "IS used to support or shape an organization's competitive strategy, its plan for gaining and maintaining competitive advantage"	Chan and Huff 1992 (p. 191)
	None provided	Galliers 1991; Hatten and Hatten 1997; Hayward 1987
	"Lays plans and sets standards a coordinated and integrated approach to the provision and management of systems over the next five years or more"	Hoey 1998 (p. 19)
	"Search for competitive advantage through its [IS/IT] use"	Duhan et al. 2001 (p. 38)
	None provided	Bacon 1991
	None provided; used synonymously with IT strategy	Tai and Phelps 2000
Information Technology Strategic Plan	None provided	Wexelblat and Srinivasan 1999
IS strategic plan	Used synonymously with IS strategy	Bajjalay 1998
IT Strategy	"Written plan comprised of projects for application of information technology to assist an organization in realizing its goals (derived from Lederer and Sethi 1996)"	Gottschalk 1999a (p. 78); Gottschalk 1999b (p. 115)
	"Using IT to gain competitive advantage"	Brady and Targett 1995 (p. 387)
	"Sustaining competitive advantage using IT"	Hidding 2001 (p. 202)
	"Document containing plans, intentions and policies for the organization's current and future use of IT, and 'softer' IT related issues such as ..."	Brady et al. 1992 (p. 187)
	No explicit definition provided; referring to (Parsons 1983): "General frameworks which guide the opportunities of IT which are identified, the IT resources which are developed, the rate at which new technologies are adopted, the level of impact of IT within the firm"	Kanungo et al. 2001 (p. 31)
	Citing Parsons(1983): "central tendencies which firms use to guide IT/IS within the business"	Ward 1987 (p. 22)
	None provided; used synonymously with IS strategy	Tai and Phelps 2000
IT/IS strategy	"Ways in which IT/IS is used to deliver a strategy"; used indifferently with SIS; referring to (Wiseman 1985): "information systems used to support or shape the competitive strategy of the organization"	Atkins 1994 (p. 123)
Long-range IS planning document	"Long range/strategic planning" as "a process that considers three or more years into the future and involves the development of EDP/MIS objectives and the implementation of strategies and policies to achieve these objectives"	Conrath et al. 1992 (p. 367)
MIS plan	The "observable outcome" of "strategic IS planning"	Pyburn 1983 (p. 3)

Term Used	Definition Provided	Source
MIS Strategy Set	"Will guide the design and development of the MIS" as derived from the organizational strategy set"	King 1978 (p. 28)
Strategic information plan	"A portfolio of computer-based applications that will assist an organization in executing its business plans and realizing its business goals"	Lederer and Salmela 1996 (p. 237)
Strategic Information Systems Planning	"Identification and successful implementation of strategic information systems"	Galliers 1991 (p. 55)
Strategic plan for Information systems	"Output of the IS planning process"	Teo and Ang 2000 (p. 275)
Strategic plan for MIS	None	Ein-Dor and Segev 1978
Strategies for information systems	Used synonymously with IS strategy	Ward 1987

Appendix B

Literature Review Process

Following Webster and Watson (2002), our literature review began with a keyword search from several literature databases, giving access to a broad spectrum of international IS and business journals.² The extent to which leading journals according to the ISWorld³ ranking are covered is depicted in Table B1. We searched EBSCO/Business Source Complete, Proquest/ABI Inform, and Science Direct for the string "(Info* OR IT OR IS) AND strategy*" in title, abstract and keywords. This search resulted in 1,235 articles. (Full coverage of the journals can be found on the website of the respective databases.)

Some relevant articles are invariably overlooked in such a search while a large amount of irrelevant articles are found. In order to overcome these shortcomings we also conducted a manual scan of the titles and abstracts of all volumes (starting in 1970; before that, information strategy had not been discussed) and issues of leading relevant IS and business journals listed in the ISWorld ranking. Relevant for our purposes are high ranking journals that are most likely to cover strategic topics (e.g., by having strategy/strategic management in their title, or explicitly mentioned in their mission statement, as core topics). Table B2 summarizes the journals covered in this manual scan. The manual scan resulted in adding a further 419 articles to the 1,235 articles from the database search.

We then reviewed the abstracts of all articles of our literature base for relevance. This led us to exclude 1,253 articles (984 from the database and 269 from the manual search⁴) from the relevant literature base. The excluded articles were either not related to strategy as defined in the working definition or were not related to IS/IT in any way.⁵

Hence, this review left us with 401 articles that were somehow related to IS/IT and strategy. Our focus is on IS strategy and its content which is distinct from the process and the impact (see Figure 1). Grouping the 401 articles into these categories resulted in only 43 articles covering

²Since the focus is on the academic discussion, we excluded practitioner magazines, trade journals, etc. from the review. We also excluded non-scholarly contributions such as editorials or book reviews. These were only included if referenced by any of the articles included in the review.

³"MIS Journal Rankings," <http://www.bus.ucf.edu/csaunders/newjournal.htm>.

⁴A very broad filter was used in the manual search; we deliberately used the rule to include all articles that might somehow be related to IT/IS and strategy in order to be sure to not leave out any potential article. As scanning hundreds of articles can become a tedious job, no classification had been done at this point. This explains why in the later review step, a large number of articles were excluded from the literature base.

⁵A large number of articles can be attributed to this category since the EBSCO database does not allow specifying case sensitivity in search strings. As we had to include "IS" and "IT" in our search string, this resulted in including many articles containing the verb *is* or the word *it*.

the content of IS strategy⁶ (i.e., 358 articles covered either the *process* or the *impact*⁷). When reading these 43 articles in depth, we discovered references to 5 other articles covering the content of IS strategy, finally resulting in 48 relevant articles for this study.

Table B1. Coverage of International Top Journals by Database Search

Number	Journal Name	Starting Year	Starting Volume	Starting Issue	Source Used
1	MIS Quarterly	1977	1	1	EBSCO
2	Information Systems Research	1990	1	1	EBSCO
3	Communications of the ACM	1965	8 [†]	1	EBSCO
4	Management Science	1954	1	1	EBSCO
5	Journal of Management Information Systems	1984	1	1	EBSCO
6	Decision Sciences	1970	1	1	EBSCO
7	Harvard Business Review	1922	1	1	EBSCO
8	European Journal of Information Systems	1993	2	1	Proquest
9	Decision Support Systems	1997	19	1	EBSCO
10	Information & Management	1977	1	1	Science Direct

[†]We considered starting with Volume 8 as appropriate given the fact that this volume is from 1965. Hardly any information strategy related publications can be expected prior to 1970. This is confirmed by our analysis.

Table B2. Journals Included in Manual Search

Number	Journal Name	Starting Year	Starting Volume	Starting Issue	Primary Field
1	MIS Quarterly	1977	1	1	IS
2	Information Systems Research	1990	1	1	IS
3	Journal of Information Technology	1998	13	1	IS
4	Journal of MIS	1984	1	1	IS
5	IEEE Transactions on Engineering Management	1994	41	1	IS
6	Information & Management	1977	1	1	IS
7	European Journal of Information Systems	1992	1	1	IS
8	Journal of the Association of Information Systems (AIS)	2000	1	1	IS
9	Communications of the AIS	1999	1	1	IS
10	Journal of Strategic Information Systems	1991/92	1	1	IS
11	Management Science	1970	16	5	Business
12	Harvard Business Review	1970	48	1	Business
13	Academy of Management Journal	1970	13	1	Business
14	Academy of Management Review	1976	1	1	Business
15	Strategic Management Journal	1980	1	1	Business

⁶An article can cover multiple categories.

⁷In fact, the categories were derived bottom-up (i.e., by multiple rounds of grouping articles with similar research questions/topics) rather than top-down. Besides the three categories of process, impact and content, we also had the categories *implementation* and *alignment*. However, the articles in these categories did not cover the content of IS strategy.

Appendix C

List of the 48 Articles Examining IS Strategy and Their Conceptions

Article ID	Authors	Journal	Year	Volume	Issue
Conception 1: IS Strategy as the Use of IT to Support Business Strategy					
1	Duhan, S., Levy, M., and Powell, P.	European Journal of Information Systems	2001	10	1
2	Gottschalk, P.	Information & Management	1999	36	2
3	Gottschalk, P.	European Journal of Information Systems	1999	8	2
4	Gottschalk, P.	Long Range Planning	1999	32	3
5	Hatten, M.L., Hatten, K.J.	Long Range Planning	1997	30	2
6	Brady, T., and Targett, D.	Technology Analysis & Strategic Management	1995	7	4
7	Hoey, A.	International Review of Law, Computers & Technology	1998	12	1
8	Hidding, G.J.	Journal of Strategic Information Systems	2001	10	3
9	Atkins, M.H.	Journal of Strategic Information Systems	1994	3	2
10	Wilson, T.D.	International Journal of Information Management	1989	9	
11	Codington, S., and Wilson, T.D.	International Journal of Information Management	1994	14	
12	Chan, Y.E., Huff, S.L., Donald W., and Copeland, D.G.	Information Systems Research	1997	8	2
13	Chan, Y.E., Huff, S. L., and Copeland, D.G.	Journal of Strategic Information Systems	1997	6	4
14	Holland, C., and Lockett, G.	Journal of Strategic Information Systems	1992	1	3
15	Sutherland, E., and Morieux, Y.	Journal of Information Technology	1988	3	1
16	Chan, Y.E., and Huff, S.L.	Journal of Strategic Information Systems	1992	1	4
17	Venkatraman, N.	Journal of Management Information Systems	1985	2	3
18	Wilkes, R.B.	Information & Management	1991	20	1
19	Mason, R. M.	Journal of Management Information Systems	1991	8	2
20	Angell, I. O.	Journal of Information Technology	1990	5	3
Conception 2: IS Strategy as the Master Plan of IS Function					
21	Tai, L.A., and Phelps, R.	European Journal of Information Systems	2000	9	3
22	Henderson, J.C., and Venkatraman, N.	IBM Systems Journal	1999	38	2
23	Bajjaly, S.T.	American Review of Public Administration	1998	28	1
24	Conrath, D.W., Ang, J.S.K., and Mattay, S. J.	INFOR	1992	30	4
25	Bacon, N.	Journal of Information Technology	1991	6	2
26	Hayward, R.G.	Long Range Planning	1987	20	2
27	Lucas, H.C., and Turner, J.A.	Sloan Management Review	1982	23	3
28	Ein-Dor, P., and Segev, E.	Management Science	1978	24	15

Article ID	Authors	Journal	Year	Volume	Issue
29	King, W.R.	MIS Quarterly	1978	2	1
30	Peppard J. and Ward J.	Journal of Strategic Information Systems	2004	13	2
31	Ragu-Nathan, B., Ragu-Nathan, T.S., Tu, Q., and Shi, Z.	Journal of Strategic Information Systems	2001	10	4
32	Smits, M.T., van der Poel, K. G., and Ribbers, P. M. A.	Journal of Strategic Information Systems	1997	6	2
33	Lederer, A.L., and Salmela, H.	Journal of Strategic Information Systems	1996	5	3
34	Smits, M. T., and van der Poel, K.G.	Journal of Strategic Information Systems	1996	5	2
35	Brady, T., Cameron, R., Targett, D., and Beaumont, C.	Journal of Strategic Information Systems	1992	1	4
36	Pyburn, P. J.	MIS Quarterly	1983	7	2
37	Adler, P.S., McDonald, D. W., and MacDonald, F.	Sloan Management Review	1992	33	2
38	Wexelblat, R. L., Srinivasan, N.	Information & Management	1999	35	
39	Das, S.R., Zahra, S.A., and Warkentin, M.E.	Decision Sciences	1991	22	5
40	Reponen, T.	Information Systems Journal	1994	4	
41	Flynn, D.J., and Hepburn, P.A.	European Journal of Information Systems	1994	3	3
42	Galliers, R.D.	European Journal of Information Systems	1991	1	1
10	Wilson, T.D.	International Journal of Information Management	1989	9	
11	Codington, S., and Wilson, T.D.	International Journal of Information Management	1994	14	
43	Allen, D.K., and Wilson, T.D.	International Journal of Information Management	1991	16	4
44	Teo, T.S. H., and Ang, J. S. K.	Behaviour & Information Technology	2000	19	4
45	Abdul-Gader, A.H.	International Journal of Information Management	1997	17	1
Conception 3: IS Strategy as the Shared View of IS Role within the Organization					
21	Tai, L.A., and Phelps, R.	European Journal of Information Systems	2000	9	3
23	Bajjaly, S.T.	American Review of Public Administration	1998	28	1
46	Ward, J.M.	Long Range Planning	1987	20	3
31	Ragu-Nathan, B., Ragu-Nathan, T. S. , Tu, Q., and Shi, Z.	Journal of Strategic Information Systems	2001	10	4
47	Kanungo, S., Sadavarti, S., and Srinivas, Y.	Journal of Strategic Information Systems	2001	10	1
48	Nolan, R., and McFarlan, F. W.	Harvard Business Review	2005	83	10
36	Pyburn, P. J.	MIS Quarterly	1983	7	2
37	Adler, P. S., McDonald, D. W., and MacDonald, F.	Sloan Management Review	1992	33	2
38	Wexelblat, R. and Srinivasan, N.	Information & Management	1999	35	

Appendix D

Development of IS Strategy Measures

To test the validity of our proposed measurement items of IS strategy typology, we employed a field survey methodology to collect data for the research instrument. Because the definition of IS strategy suggests that the strategy is an agreed upon organizational perspective of how to invest and deploy information systems, we sent separate questionnaires to the CIOs and their matched top business executives in a variety of industries. Consistent with prior research, the CIO is defined as the highest-ranking IS executive within the organization (Armstrong and Sambamurthy 1999; Grover et al. 1993). Top business executives include CEOs and business executives who are either formal members of the organization's top management team (TMT) and/or report directly to the organization's CEO. We asked the CIO and business executives to independently assess their organization's IS strategy via the questions. The scale used for these questions ranges from strongly agree (5) to strongly disagree (1).

A dual-stage matched sampling strategy was employed for the distribution of the CIO and business executive surveys. In the first stage, a total of 3,763 surveys were sent to a list of CIOs from organizations based in the United States. The CIO contact information was derived from the Dun & Bradstreet Million Dollar Database and from several professional industry associations. A total of 451 CIO surveys were returned for a total response rate of 12.0 percent for the first stage survey. In the second stage, a second instrument was sent to the selected top business executives of each organization for which we had received a completed CIO questionnaire. Business executives were identified through secondary data sources (Dun and Bradstreet Million Dollar Database and corporate websites) and were contacted within six months of collecting the CIO data. A total of 174 of the 451 organizations returned at least one business executive survey yielding an organizational response rate of 38.6 percent for the second stage survey. Non-response bias was assessed (via ANOVA) by comparing the total annual sales and number of employees for the responding organizations to that of all non-responding organizations (within the same primary SIC code) and by comparing the responses to IS strategy measures between early and late respondents. Our assessment revealed no issues with regard to response bias. In total, we derived responses from 174 matched pairs of CIOs and corresponding top business executives within the organization. We conducted an exploratory factor analysis using the responses from both the CIO and business executives from the 174 organizations to assess the psychometric properties of the scales in terms of item loadings and discriminant validity. The results are presented in Table D1.

The results of the factor analysis suggest that the CIOs and the business executives are consistent in their assessment of the organization's IS strategy. The significant factor loading coefficients confirm the convergent validity of the three types of IS strategies. We observe that both the CIO and business executives can cleanly attribute their organization's IS strategy to that of an IS innovator, IS conservative, or undefined IS strategy. Also, all of the nine questions were assessed similarly by both the CIOs and business executives. Specifically, we observe that all three innovator strategy items, conservative strategy items, and undefined strategy items load highly on their respective constructs and that there is a limited level of cross-loading of these items. To further our validation of the instrument across both IS executives and business executives, we also assessed the level of agreement between strategic decision-makers of the organization. We calculated this level of strategic agreement through r_{wg} in accordance with prior literature (James et al. 1984). The r_{wg} coefficient ranges from 0 (indicating complete disagreement) to 1 (indicating complete agreement). Prior research suggests that r_{wg} values greater than or equal to 0.60 suggest a high level of agreement and allow for the aggregation of individual responses if warranted (Glick 1985). For the 174 organizations, we examined the level of agreement between each of the strategy measures. Overall, we had a level of agreement among business executives (where we have multiple responses from business executives of the same firm) and a high rate of agreement between the CIO and these business executives (mean above 0.80) as summarized in Table D2. These findings provide additional support that these IS strategy measures can properly be assessed by either the CIO or business executives within the organization.

Table D1. Factor Analysis for IS Strategy Measures

Factor	CIO Factor Analysis			Business Executive Factor Analysis		
	1	2	3	1	2	3
Innovator1	.808	.135	-.129	.858	.195	-.263
Innovator2	.850	-.103	-.010	.908	.006	-.156
Innovator3	.787	.057	-.211	.822	.286	-.222
Conservative1	-.088	.806	-.144	.035	.733	-.139
Conservative2	.149	.804	-.245	.284	.716	.002
Conservative3	.022	.777	-.225	.089	.720	-.302
Undefined1	-.143	-.266	.889	-.186	-.152	.930
Undefined2	-.079	-.172	.913	-.177	-.097	.929
Undefined3	-.265	-.327	.684	-.349	-.312	.711

Table D2. Inter-Rater Agreement

	CIO Average [†]	Business Executive Average [†]	Overall Average	Mean r_{wg}	Median r_{wg}	% of pairs with $r_{wg} > 0.60$
Innovator	2.84	2.81	2.83	0.86	0.94	90.8%
Conservative	3.68	3.70	3.69	0.81	0.94	84.6%
Undefined	2.16	2.32	2.24	0.80	0.92	86.2%

[†]Scale: 1 = Strongly Disagree; 2 = Disagree; 3 = Neutral; 4 = Agree; 5 = Strongly Agree

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